In the Specification:

Rewrite the paragraph at page 7, lines 16-22, as follows (including the addition of several new paragraphs):

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Reference was made, above, to the system being responsive to gestures made by the child with the book, triggering different responses. This area, too, is subject to a great number of variants. For example, one gesture could cause reading of the page to start over. Another could speed up the voice. Another could select among different reading voices. Another could initiate internet-based functionality (as described above). Another could change the reading volume, etc. (Many gestures, and methods of their detection, are detailed in the parent application. Excerpts from that application are reproduced below. That application uses the term "Bedoop" for systems that respond to visual commands, and "Bedoop data" for data discerned from steganographic encoding on physical objects.)

Gestural Decoding Module

There are various ways in which the system's decoding of gestural input can be effected. In some systems, this functionality is provided as part of the applications. Generally, however, the applications must be provided with the raw frame data in order to discern the gestural movements. Since this functionality is typically utilized by many applications, it is generally preferable to provide a single set of gestural interpretation software functions (commonly at the operating system level) to analyze the frame data, and make available gestural output data in standardized form to all applications.

In one such system, a gestural decoding module tracks the encoded object within the series of image data frames, and outputs various parameters characterizing the object's position and manipulation over time. Two of these parameters indicate the X-Y position of the object within current frame of image data. The module can identify a reference

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point (or several) on the object, and output two corresponding position data (X and Y). The first represents the horizontal offset of the reference point from the center of the image frame, represented as a percentage of frame width. A two's complement representation, or other representation capable of expressing both positive and negative values, can be used so that this parameter has a positive value if the reference point is right of center-frame, and has a negative value if the reference point is left of center frame. The second parameter, Y, similarly characterizes the position of the reference point above or below center-frame (with above-being represented by a positive value). Each of these two parameters can be expressed as a seven-bit byte. A new pair of X, Y parameters is output from the gestural decoding module each time a new frame of image data is processed.

In many applications, the absolute X-Y position of the object is not important. Rather, it is the movement of the object in X and Y from frame-to-frame that controls some aspect of the system's response. The application can monitor the change in the two above-described parameters, frame to frame, to discern such movement. More commonly, however, the gestural decoding module performs this function and outputs two further parameters, X' and Y'. The former indicates the movement of the reference point in right/left directions since the last image frame, as a percentage of the full-frame width. Again, this parameter is represented in two's complement form, with positive values representing movement in the rightward direction, and negative values representing movement in the leftward direction. The later parameter similarly indicates the movement of the reference point in up/down directions since the last frame.

The scale, differential scale, and rotation states of the object can be similarly analyzed and represented by parameters output from the gestural decoding module.

Scale state can be discerned by reference to two (or more) reference points on the object (e.g., diagonal corners of a card). The

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distance between the two points (or the area circumscribed by three or more points) is discerned, and expressed as a percentage of the diagonal size of the image frame (or its area). A single output parameter, A, which may be a seven-bit binary representation, is output.

As with X-Y data, the gestural decoding module can likewise monitor changes in the scale state parameter since the last frame, and product a corresponding output parameter A'. This parameter can be expressed in two's complement form, with positive values indicating movement of the object towards the sensor since the last frame, and negative values indicating movement away.

A differential scale parameter, B, can be discerned by reference to four reference points on the object (e.g., center points on the four edges of a card). The two points on the side edges of the card define a horizontal line; the two points on the top and bottom edges of the card define a vertical line. The ratio of the two line lengths is a measure of differential scale. This ratio can be expressed as the shorter line's length as a percentage of the longer line's length (i.e., the ratio is always between zero and one). Again, a two's complement seven-bit representation can be used, with positive values indicating that the vertical line is shorter, and negative values indicating that the horizontal line is shorter. (As before, a dynamic parameter B' can also be discerned to express the change in the differential scale parameter B since the last frame, again in two's complement, seven bit form.)

A rotation state parameter C can be discerned by the angular orientation of a line defined by two reference points on the object (e.g., center points on the two side edges of a card). This parameter can be encoded as a seven-bit binary value representing the percentage of rotational offset in a clockwise direction from a reference orientation (e.g., horizontal). (The two reference points must be distinguishable from each other regardless of angular position of the object, if data in the full range of 0 – 360 degrees is to be represented. If these two points are not

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distinguishable, it may only be possible to represent data in the range of 0-180 degrees.) As before, a dynamic parameter C' can also be discerned to express the change in the rotation state parameter C since the last frame. This parameter can be in seven bit, two's complement form, with positive values indicating change in a clockwise rotation

The foregoing analysis techniques, and representation metrics, are of course illustrative only. The artisan will recognize many other arrangements that can meet the needs of the particular applications being served.

In the illustrative system, the application programs communicate with the gestural decoding module through a standardized set of interface protocols, such as APIs. One API can query the gestural input module for some or all of the current position parameters (e.g., any or all of X, Y, A, B, and C). The module responds to the calling application with the requested parameter(s). Another API can query the gestural input module for some or all of the current movement data (e.g., any or all of X', Y', A', B' and C'). Still another API can request the gestural decoding module to provide updated values for some or all of the position or movement data on a running basis, as soon as they are discerned from each frame. A complementary API discontinues the foregoing operation. By such arrangement, all of the gestural data is available, but the application programs only obtain the particular data they need, and only when they ask for it.

In applications that communicate with external servers, just the Bedoop data (i.e., CLASS, DNS, and optionally UID) may initially be sent. If the remote server needs to consider gestural data in deciding how to respond, the remote server can poll the local system for the necessary data. The requested gestural data is then sent by the local system to the remote server in one or more separate transmissions.

In other embodiments, since the gestural data is of such low bandwidth (e.g., roughly 56 bits per image frame), it may routinely and

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automatically be sent to the remote computer, so that the gesture data is immediately available in case it is needed. In an illustrative implementation, this data is assembled into an 8-byte packet, with the first byte of the packet (e.g., the X parameter) being prefixed with a "1" sync bit, and subsequent bytes of the packet being prefixed with "0" sync bits. (The sync bits can be used to aid in accurate packet decoding.)

In some embodiments, it is useful to provide for an extension to the normal 64-bit Bedoop length to accommodate an associated packet of gestural data. This can be effected by use of a reserved bit, e.g., in the UID field of the Bedoop packet. This bit normally has a "0" value. If it has a "1" value, that indicates that the Bedoop data isn't just the usual 64 bits, but instead is 128 bits, with the latter 64 bits comprising a packet of gestural data.

Similar extension protocols can be used to associate other ancillary data with Bedoop data. A different reserved bit in the UID field, for example, may signal that a further data field of 256 bits follows the Bedoop data – a data field that will be interpreted by the remote computer that ultimately services the Bedoop data in a known manner. (Such bits may convey, e.g., profile data, credit card data, etc.) The appended data field, in turn, may include one or more bits signaling the presence of still further appended data.